

Exhibit L
Part 2 of 2

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Table 4. Monitoring data. (continued)

SAMPLE SITE	MO-3	MO-5	MO-7	MO-8	MO-9	SW-1	SW-2	SW-3
<u>DATE COLLECTED: February 7, 1984</u>								
<u>Field analysis:</u>								
pH	-	-	-	-	-	-	-	-
Specific conductance (micromhos)	-	-	-	-	-	-	-	-
Water level (feet below measuring point)	14.06	70.86	-	-	-	1/	1/	1/
Discharge (cfs)	1/	1/	Dry	Dry	Dry	Dry	1	1 - 2
<u>Laboratory analysis:</u>								
Total iron (mg/l)	-	-	-	-	-	-	-	-
Total manganese (mg/l)	-	-	-	-	-	-	-	-
Total dissolved solids (mg/l)	-	-	-	-	-	-	-	-
Total suspended solids (mg/l)	-	-	-	-	-	-	-	-
<u>DATE COLLECTED: March 5, 1984</u>								
<u>Field analysis:</u>								
pH	3.25	2.70	-	-	-	-	5.60	3.25
Specific conductance (micromhos)	5,000	8,700	-	-	-	-	60	4,050
Water level (feet below measuring point)	14.23	70.72	Dry	Dry	Dry	Dry	1/	1/
Discharge (cfs)	1/	1/	1/	1/	1/	Dry	2	2
<u>Laboratory analysis:</u>								
Total iron (mg/l)	176	762	-	-	-	-	0.65	213
Total manganese (mg/l)	15.6	18.1	-	-	-	-	0.14	30.4
Total dissolved solids (mg/l)	6,270	12,768	-	-	-	-	131	6,473
Total suspended solids (mg/l)	118	276	-	-	-	-	206	8
Sulfate (mg/l)	3,600	9,600	-	-	-	-	20	4,200

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Table 4. Monitoring data. (continued)

SAMPLE SITE	MO-3	MO-5	MO-6	MO-7	MO-8	MO-9	SH-1	SH-2	SH-3
<u>DATE COLLECTED: May 2, 1984</u>									
<u>Field analysis:</u>									
pH	3.09	2.18	3.90	-	-	-	-	6.12	2.69
Specific conductance (micromhos)	2,070	9,500	9,500	-	-	-	-	79	11,200
Water level (feet below measuring point)	6.09	61.34	-	Dry	Dry	Dry	1/	1/	1/
Discharge (cfs)	1/	1/	-	1/	1/	1/	Dry	1	1
<u>Laboratory analysis:</u>									
Total iron (mg/l)	95	834	1,492	-	-	-	-	0.36	1,805
Total manganese (mg/l)	14.5	21.2	35.5	-	-	-	-	0.08	59.9
Total dissolved solids (mg/l)	2,167	15,607	17,398	-	-	-	-	42	29,832
Total suspended solids (mg/l)	177	31	2,935	-	-	-	-	2.5	2.0
Sulfate (mg/l)	900	10,400	7,000	-	-	-	-	17.0	18,000
<u>DATE COLLECTED: July 6, 1984</u>									
<u>Field analysis:</u>									
pH	2.47	2.01	-	-	-	-	-	-	2.46
Specific conductance (micromhos)	15,000	10,700	-	-	-	-	-	-	17,000
Water level (feet below measuring point)	20.30	72.38	-	Dry	Dry	Dry	-	-	-
Discharge (cfs)	1/	1/	-	1/	1/	1/	Dry	Dry	1 - 2
<u>Laboratory analysis:</u>									
Total iron (mg/l)	1,340	3,600	-	-	-	-	-	-	703
Total manganese (mg/l)	67	33	-	-	-	-	-	-	72
Total dissolved solids (mg/l)	24,700	15,000	-	-	-	-	-	-	41,700
Total suspended solids (mg/l)	352	51	-	-	-	-	-	-	28
Sulfate (mg/l)	16,400	8,900	-	-	-	-	-	-	24,400 35

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Table 4. Monitoring data. (continued)

SAMPLE SITE	MO-3	MO-5	MO-7	MO-8	MO-9	SW-1	SW-2	SW-3
<u>DATE COLLECTED: September 5, 1984</u>								
<u>Field analysis:</u>								
pH	2.85	2.75	-	-	-	-	-	2.88
Specific conductance (micromhos)	8,000	6,500	-	-	-	-	-	20,000
Water level (feet below measuring point)	22.62	76.99	Dry	Dry	Dry	1/	1/	1/
Discharge (cfs)	1/	1/	1/	1/	1/	Dry	Dry	0.10
<u>Laboratory analysis:</u>								
Total iron (mg/l)	1,082	320	1/	1/	1/	1/	1/	3,119
Total manganese (mg/l)	51	13.5	1/	1/	1/	1/	1/	152
Total dissolved solids (mg/l)	13,620	7,470	1/	1/	1/	1/	1/	44,060
Total suspended solids (mg/l)	264	208	1/	1/	1/	1/	1/	27
Sulfate (mg/l)	9,650	5,260	1/	1/	1/	1/	1/	30,000

1/ Does not apply.

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Table 5. Quality of ground water in undisturbed areas of the Pottsville Formation (after Harkins and others, 1980).

Constituent ^{1J}	Range		Average	Number of Samples
Iron	0.1	-	7.4	0.89
pH (units)	6.4	-	9.4	8.4
Specific conductance (micromhos per centimeter at 25°C)	37	-	1,750	504
Sulfate	0.2	-	37	11

^{1J} concentration in milligrams per liter unless otherwise specified.

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Table 6. Quality of ground water in pre-law water samples collected from wells MO-3, MO-5, and MO-6.

Constituent ^{1J}	Range			Average	Number of Samples
Iron	95	-	3,600	1,109.83	21
pH (units)	2.01	-	4.25	2.96	21
Specific conductance (micromhos per centimeter at 25°C)	490	-	15,500	8,643	20
Sulfate	900	-	26,400	11,117.14	21

^{1J} concentration in milligrams per liter unless otherwise specified.

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The values in Table 5 may be used for general comparison to those of pre-law ground-water samples summarized in Table 6. All values of constituents determined from monitoring activities at the rock disposal area for samples obtained from pre-law ground-water sites (sites MO-3, MO-5, and MO-6) exceed the range of values given in Table 5.

Typical values for iron, pH, specific conductance, and dissolved solids for surface water in disturbed and undisturbed areas of the Pottsville Formation in the Warrior Basin in the vicinity of the Maxine Mine are given in Table 7. Values of constituents determined from surface-water monitoring activities at the rock disposal area are summarized in Tables 8 and 9. Surface water draining from pre-law area is sampled at surface-water sites SW-1 and SW-3. Surface water draining from the post-law, capped area is sampled at surface-water site SW-2. The values of the constituents for SW-2 water samples (Table 9) are close to the ranges given in Table 7 for water samples collected in undisturbed areas.

The values of the same constituents for sites SW-1 and SW-2 (pre-law) water samples (Table 6) always exceed the ranges for typical undisturbed areas and generally exceed the ranges of values given for water samples from disturbed areas.

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Table 7. Quality of surface water in streams in disturbed and undisturbed regions of the Pottsville Formation (after Harkins and others, 1980).

Constituent ^{1J}	Range					
	Undisturbed Area			Disturbed Area		
Iron	0.001	-	0.1 (1 site)	0.01	-	4.0 (3 sites)
pH (units)	6.0	-	7.5	2	-	7
Specific conductance (micromhos per centimeter at 25°C)	20	-	120	30	-	3,000
Sulfate	5.6	-	40 (2 sites)	4	-	1,400 (6 sites)
Dissolved solids	13.6	-	81.6	204	-	20,400

^{1J} concentration in milligrams per liter unless otherwise specified.

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Table 8. Quality of surface water in pre-law water samples collected from SW-1 and SW-3.

Constituent ^{1J}	Range		Average	Number of Samples
Iron	213	- 3,119	1,853.25	12
pH (units)	2.46	- 3.35	2.81	12
Specific conductance (micromhos per centimeter at 25°C)	1,000	- 21,500	12,895.45	11
Sulfate	4,200	- 30,000	20,935.42	12
Dissolved solids	6,473	- 44,060	32,275.50	12

^{1J} concentration in milligrams per liter unless otherwise specified.

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Table 9. Quality of surface water in post-law water samples collected from SW-2.

Constituent ^{1J}	Range			Average	Number of Samples
Iron	0.02	-	1.90	0.50	7
pH (units)	4.23	-	6.12	5.04	7
Specific conductance (micromhos per centimeter at 25°C)	30	-	205	111.33	6
Sulfate	17	-	33	21.64	7
Dissolved solids	26	-	170	74.14	7

^{1J} concentration in milligrams per liter unless otherwise specified.

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The difference in chemical character of the water quality of post-law and pre-law surface and ground water is shown in Figures 11 and 12. These figures illustrate that there is an exponential relationship between total dissolved solids and specific conductance or sulfate for the samples collected. (Specific conductance cannot be directly correlated to total dissolved solids for highly acidic water samples, but can be used for generalized correlation.) Figures 11 and 12 illustrate that the concentrations of total dissolved solids, specific conductance, and sulfate are significantly higher for samples collected in pre-law refuse areas than they are for those collected in post-law refuse areas. Water from pre-law and post-law water samples originates from the same source as evidenced by similar ratios of specific conductance to total dissolved solids and sulfate to total dissolved solids for samples of ground water and surface water in pre-law rock and surface water in post-law refuse rock.

The results of chemical analyses of water from wells MO-3, MO-5, and MO-6 were compared in order to identify differences in water quality between the upgradient pre-law water (from wells MO-5 and MO-6) and the downgradient pre-law water (from well MO-3). The water quality parameters indicate that, in general, the quality of water in upgradient wells is more mineralized than water in downgradient wells during normal and wet hydrologic periods. During dry periods the quality of water from downgradient well MO-3 is more mineralized than that from the upgradient pre-law wells. It is probable that the quality of water from MO-3 is better during normal and wet periods because of the short residence time of water in the area and because of dilution by

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the large quantity of ground water moving through the valley. During dry periods the water in the valley may be more stagnant than that from upgradient wells due to the low hydraulic gradient in the valley. Therefore, the residence time of the water in the valley is greater during dry periods and the resultant water quality is worse.

PELA monitored SW-2 since reclamation and found that the total iron and total manganese contents have always been less than the effluent limits for maximum daily discharge and the pH has been lower than the limit in only one sample.

Alabama By-Products also monitored water quality at site SW-2 since November 22, 1984. The results of their monitoring activities indicate that the total iron concentration was always less than the effluent limits, the total manganese was less than the limit in five out of six samples and the pH was lower than 6.0 only once during the runs.

A comparison of the quality of water from pre-law well MO-3 over time, as indicated in Table 4, shows that the average quality of water from the well has improved since placement of the clay cap over the post-law refuse rock.

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REFERENCES

Freeze, R. A., and Cherry, J. A., 1979, Groundwater: Prentice-Hall, Inc., N.J., 604 p.

Harkins, J. R., and others, 1980, Hydrologic Assessment, Eastern Coal Province Area 23, Alabama, U.S. Geological Survey Open File Report 80-683, 76 p.



APPENDIX I

Methodology of Well Construction for Wells MO-5, MO-6, MO-7, MO-8, and MO-9

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A-1, 1

**Methodology of Well Construction for Wells
MO-5, MO-6, MO-7, MO-8, and MO-9**

The wells MO-5, MO-6, MO-7, MO-8, and MO-9 were drilled with 6-inch hollow stem augers. Samples were collected at various intervals by a split spoon sampler (18 inches in length). Samples were retained and detailed descriptions completed. Descriptions are given in Appendix II.

Wells MO-5 and MO-6 were drilled to locate and verify existence of a valley filled with pre-law refuse. Well MO-5 was drilled to a total depth of 80 feet. The contact between the bottom of the refuse material and top of the buried soil zone was 76 feet. A wet clay layer was observed at 78 feet below land surface. Well MO-5 was cased with slotted PVC casing from 2 feet to 80 feet below land surface, and the bottom of the slotted PVC casing was capped. A solid section of PVC casing was installed from 2 feet below land surface to above land surface (fig. 2).

Well MO-6 was drilled to a depth of 75 feet below land surface. The contact between the refuse material and the buried soil zone was at 74 feet below land surface. The lower 3.5 feet of the well had filled in due to caving. Well MO-6 was cased with slotted PVC casing from 2 feet below land surface to 71.5 feet below land surface (where the casing was capped). A solid section of PVC casing was installed from 2 feet below land surface to above land surface (fig. 3).

Wells MO-7 and MO-8 were drilled and constructed to compare water movement and quality in the pre-law refuse to that in the post-

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A-1, 2

law refuse. The two wells were drilled in an upgradient position in the capped area.

Well MO-7 was drilled with 6-inch hollow stem augers and sampled continuously with the split spoon to define the contact between the pre-law and post-law refuse material (16.5 feet below land surface). Well MO-7 was drilled to a depth of 63 feet below land surface. The contact between the refuse material and the buried soil zone was at 62.5 feet below land surface. Caving of the walls filled the lower 4.5 feet of the well. Well MO-7 was cased with slotted PVC casing from the contact between the post-law and pre-law refuse material to 58.5 feet below land surface (where the casing was capped). A solid section of PVC was installed from the post-law/pre-law contact to above land surface (fig. 4).

Well MO-8 was drilled to a depth of 17 feet below land surface; 0.5 feet below the post-law/pre-law contact. Caving of the walls filled the lower 1.5 feet of the well. Well MO-8 was cased with slotted PVC casing from 15.5 feet below land surface (where the casing was capped) to 2 feet below land surface. A solid section of PVC casing was installed from 2 feet to above land surface (fig. 5).

Well MO-9 was drilled at a downgradient position in the capped area. The contact between the post-law refuse and the top of the valley fill (alluvial material -- transported pre-law refuse) was at 41 feet. Well MO-9 was drilled to a total depth of 45 feet to compensate for anticipated caving. Well MO-9 was cased with slotted PVC casing from 41 feet below land surface (where the casing was capped) to 3.5

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A-I, 3

feet below land surface. A solid section of PVC casing was installed at 3.5 feet blow land surface to above land surface (fig. 6).

In all the wells the annular space between the slotted PVC and the wall of the drilled hole was packed with filter sand. The annular space between the solid PVC casing and the wall of the drilled hole was grouted.



APPENDIX II

Lithologic Logs for Wells MO-3, MO-4, MO-5,
MO-6, MO-7, MO-8, and MO-9

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A-II, 1

MAXINE ROCK DISPOSAL AREA

Well No. MO-3

Drilled: 1/18/83

Blow Counts	Interval Sampled (feet)	Description
3-3	0 - 1.0	Refuse material; dark-greenish-gray (5GY 4/1) to greenish-black (5G 2/1), semi-consolidated, weathered, poorly sorted, sandy clay, shale fragments, coal fragments, large (15 mm) sandstone fragments, "red rock" fragments, mica, pyrite, iron staining.
2-6-9	4.5 - 6.0	Refuse material; light-olive-brown (5Y 5/6) to olive-gray (5Y 4/1), consolidated, weathered, predominantly sandy clay, shale fragments, coal fragments, "red rock" fragments, mica, iron staining, roots, damp.
3-3-3	9.5 - 11.0	Refuse material; olive-gray (5Y 3/2), sandy clay, unconsolidated, poorly sorted, large (15 mm) shale and sandstone fragments, iron staining, "red rock" fragments, coal fragments.
Water at 10.0 feet.		
3-2-2	14.5 - 16.0	Refuse material; olive-gray (5Y 4/11) to olive-black (5Y 2/1), consolidated, predominantly sandy clay, large "red rock" fragments (10 to 30 mm), coal and shale fragments, layered, iron staining, sulfur crystals, wet.
4-4-4	19.5 - 21.0	Refuse material; greenish-black (5G 2/1) to dark-gray (N3), small (1.0 to 2.0 mm) unconsolidated fragments of shale, coal, "red rock" and sandstone; at 20 feet becomes clayey with shale fragments (10 mm), stem fragments, and "red rock", shale, mica, iron staining, wet.

Drilling harder at 21.0 feet.

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A-II, 2

Well No. MO-3
(continued)

Blow Counts	Interval Sampled (feet)	Description
5-4-5	22.0 - 23.5	Refuse material; olive-black (5Y 2/1), sandy clay layer with small (0.5 to 1.0 mm) fragments of shale, "red rock" and sandstone, iron staining, some mica. Very little clay at 23.0 to 23.5 feet, unconsolidated, poorly sorted fragments (2 to 3 mm) of shale and "red rock", some coal fragments, mica, iron staining, wet.
6-4-5	24.5 - 26.0	Refuse material; grayish-black (N2) to olive-black (5Y 2/1), clay, sandy to 25.0 feet with small fragments (1.0 to 2.0 mm) of shale and "red rock", mica. From 25.0 to 26.0 feet - organics, clay - increasing in sand, scattered large fragments (4 to 10 mm) of shale and "red rock", mica, wet.
46-33-50	27.0 - 28.5	Refuse material to 27.5 feet; grayish-black (N2) to olive-black (5Y 2/1), sandy clay, small fragments (1 to 2 mm) of shale, larger (2 to 5 mm) fragments of "red rock", very micaceous, wet. 27.5 to 28.5 - weathered bedrock; clayey sand, moderate-yellow (5Y 7/6) to moderate-olive-brown (5Y 4/4), mottled, fine- to medium-grained, very micaceous, iron staining.

Drilling completed.

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A-II, 3

MAXINE ROCK DISPOSAL AREA

Well No. MO-4

Drilled: 1/18/83

Blow Counts	Interval Sampled (feet)	Description
4-3-3	4.5 - 6.0	Refuse material; grayish-black (N2) to greenish-black (5G 2/1), weathered, unconsolidated, scattered clay layers, shale and coal fragments (1 to 10 mm), mica.
5-3-6	9.5 - 11.0	Refuse material; greenish-black (5G 2/1) to black (N1), mostly unconsolidated, weathered, scattered clay layers, sandy clay, coarse-grained, scattered coal fragments (10 to 20 mm), mica, shale fragments, iron staining.
6-5-3	14.5 - 16.0	Refuse material; greenish-black (5G 2/1) to black (N1), sandy clay, medium-grained, shale fragments (15 mm), scattered clay fragments (20 mm), coal fragments (1 to 5 mm), very micaceous, iron staining.
4-4-2	19.5 - 21.0	Refuse material; grayish-black (N2) to black (N1), clayey sand, medium- to fine-grained, semi-consolidated, large fragments (10 to 20 mm) of shale, scattered sandstone fragments (2 mm), very micaceous.
3-2-3	24.5 - 26.0	Refuse material; black (N1), sandy clay, medium- to fine-grained, semi-consolidated, large fragments of shale and shaly sandstone (10 to 20 mm), very-dark-red (5R 2/6) iron staining, very micaceous.
3-3-3	29.5 - 31.0	Refuse material; grayish-black (N2) to black (N1), sandy clay, medium- to fine-grained, semi-consolidated, large fragments of shale, sandy shale and clay (10 to 20 mm) with plant fossils, scattered coal fragments (2 mm), very micaceous, very-dark-red (5R 2/6) to grayish-orange (10YR 7/4), iron staining.

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A-II, 4

Well No. MO-4
(continued)

Blow Counts	Interval Sampled (feet)	Description
4-4-4	34.5 - 36.0	Refuse material; grayish-black (N2) to black (N1), sandy clay, fine-grained, shale fragments (2 to 10 mm), coal fragments (2 mm), scattered clay layers, predominantly dark-yellowish-orange (10YR 6/6) iron staining with some very-dark-red (5R 2/6) iron staining, very micaceous.
5-4-4	39.5 - 41.0	Refuse material; as above, slightly more clay.
3-4-6	44.5 - 46.0	Refuse material to 45.0 feet; grayish-black (N2) to black (N1), sandy clay, consolidated, scattered shale fragments (10 mm), dark-yellowish-orange (10YR 6/6) iron staining, very micaceous.
		45.0 to 46.0 - clay; moderate-brown (5YR 4/4) to light-brown (5YR 5/6), mottled, sandy, some shale fragments, root and stem pieces, some mica.
4-5-17	49.5 - 51.0	Clay; light-brown (5YR 5/6) to moderate-reddish-brown (10R 4/6), mottled, sandy, some shale fragments, root and stem pieces, some mica.

Drilling completed.

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A-II, 5

MAXINE ROCK DISPOSAL AREA

Well No. MO-5

Drilled: 7/26/83 - 7/27/83

Blow Counts	Interval Sampled (feet)	Description
<u>Augered:</u>	0 - 40.0	Refuse material, brownish-black (5 YR 2/1) to dark-gray (N3), sandy clay, fine-grained, "red rock" fragments, shale fragments, coal fragments. Refuse material more sandy at 15.0 feet with large sandstone and sandy shale (12 to 25 mm) fragments. At 20.0 feet - refuse material, blackish-red (5R 2/2), clayey sand with sandstone fragments (8 to 12 mm), "red rock" fragments (10 to 20 mm) at 30.0 feet.
	<u>Sampled at 40.0 feet.</u>	
5-6-6	40.0 - 41.5	Refuse material, blackish-red (5R 2/2) clayey sand, fine-grained, large coal fragments (38 mm), shale and sandstone fragments, dusky-red (5R 3/4) stain on sandstone and shale fragments.
6-10-13	50.0 - 51.5	Refuse material, blackish-red (5R 2/2) clayey sand, fine-grained, large coal and shale fragments (38 mm), dusky-red (5R 3/4) stain, clay layers, medium-light-gray (N6).
6-9-12	60.0 - 61.5	Refuse material, dark-gray (N3) to grayish-black (N2), clayey sand, fine-grained, coal and shale fragments.
- - 10	65.0 - 66.5	Refuse material, dark-gray (N3) to grayish-black (N2), clayey sand, fine-grained, coal and shale fragments, pyrite.
- - 10	70.0 - 71.5	Refuse material, dark-gray (N3) to grayish-black (N2), clayey sand, fine-grained, small coal and shale fragments (2 to 3 mm), sulfur crystals.

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A-II, 6

MAXINE ROCK DISPOSAL AREA

**Well No. MO-5
(continued)**

Drilled: 7/26/83 - 7/27/83

Blow Counts	Interval Sampled (feet)	Description
	75.0 - 76.5	Refuse material to 76.0 feet. At 76.0 feet clay, dark-yellowish-orange (10YR 6/6) and light-brown (5YR 5/6), mottled, silty.
	76.5 - 80.0	Clay, dark-yellowish-brown (10YR 6/6) sandy, wet.

Drilling completed.

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A-II, 7

MAXINE ROCK DISPOSAL AREA

Well No. MO-6

Drilled: 7/27/83

Blow Counts	Interval Sampled (feet)	Description
<u>Augered:</u>	0 - 60.0	Refuse material as in MO-5. At 47.0 feet - hard drilling, large sandstone fragments (25 to 38 mm), dark-gray (N3).
<u>Sampled at 60.0 feet.</u>		
8-9-11	60.0 - 61.5	Refuse material, dark-gray (N3), clayey sand, fine-grained, hard clay fragments (2 to 4 mm), light-gray (N7), coal fragments (2 mm), dusky-red (5R 3/4) stain.
8-14-16	65.0 - 66.5	Refuse material, dark-gray (N3), sandy clay, very-fine-grained, coal and shale fragments (2 to 4 mm), light-brown (5YR 5/6) stain.
8-9-5	70.0 - 71.5	Refuse material, dark-gray (N3), sandy clay, very-fine-grained, shale fragments (13 mm), increased light-brown (5YR 5/6) stain.
	75.0 - 76.5	Clay, light-brown (5YR 5/6), dark-yellowish-orange (10YR 6/6), mottled, at 76.0 feet moderate-brown (5YR 4/4), very-fine-grained, sandy.

Drilling completed.

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A-II, 8

MAXINE ROCK DISPOSAL AREA

Well No. MO-7

Drilled: 7/28/83

Blow Counts	Interval Sampled (feet)	Description
- 11 -	0 - 1.5	Clay cap, light-brown (5YR 5/6), grayish-brown (5YR 3/2), moderate-reddish-brown (10R 4/6), mottled, sandy, fine-grained, micaceous.
18-27-37	1.5 - 3.0	Clay cap to 2 feet. At 2 feet refuse material, grayish-black (N2), clayey sand, fine-grained, clay layers, medium-dark-gray (N4), weathered pale-reddish-brown stain.
33-32-30	3.0 - 4.5	Refuse material, dark-gray (N3), sandy clay, very-fine-grained, clay layers, medium-light-gray (N4) to medium-gray (N5), hard, coal and shale fragments (2 to 3 mm).
13-27-30	4.5 - 6.0	Refuse material, medium-dark-gray (N4), sandy clay, very fine-grained, large sandstone fragments (19 mm), micaceous, shale and coal fragments (1 to 2 mm), dark-yellowish-orange stain (10YR 6/6).
9-8-7	6.0 - 7.5	Refuse material, grayish-black (N2) to black (N1), clayey sand, very-fine-grained, coal fragments (1 to 2 mm), sandstone fragments (12 mm).
4-4-3	7.5 - 9.0	Refuse material, grayish-black (N2) to black (N1), clayey sand, very-fine-grained, coal and shale fragments (1 mm), shaly sandstone fragments (12 mm).
2-3-5	9.0 - 10.5	Refuse material, grayish-black (N2) to black (N1), clayey sand, very-fine-grained, sandstone fragments (6 mm), large coal fragments (19 mm).

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MAXINE ROCK DISPOSAL AREA

Well No. MO-7
(continued)

Drilled: 7/28/83

Blow Counts	Interval Sampled (feet)	Description
12-17-13	10.5 - 12.0	Refuse material, dark-gray (N3), clayey sand, very-fine-grained, layer of large sandstone fragments (19 to 26 mm) at 10.5 to 10.8.
10-8-4	12.0 - 13.5	Refuse material, dark-gray (N3), sandy clay, very-fine-grained, shale and coal fragments (0.5 to 1 mm), layer of large sandstone fragments (19 to 26 mm) at 12.0 to 13.0 feet, medium-gray (N5), very micaceous.
5-4-18	13.5 - 15.0	Refuse material, grayish-black (N2) to black (N1), sandy clay, very-fine-grained, shale fragments (0.5 to 1 mm). At 14.5 to 15.0 feet large sandstone fragments (25 mm), medium-light-gray (N6), hard, micaceous.
12-15-11	15.0 - 16.5	Refuse material, grayish-black (N2) to black (N1), sandy clay, coal and shale fragments (0.5 to 1 mm), sandy shale and sandstone fragments (6 to 12 mm), medium-dark-gray (N4).
16-13-21	16.5 - 18.0	Refuse material, medium-dark-gray (N4) to medium-gray (N5), sandy clay, more clay than above, fine- to medium-grained, coal and shale fragments (2 to 6 mm), dark-yellowish-orange (10YR 6/6) stain.
11-8-8	18.0 - 19.5	Refuse material, medium-gray (N5), sandy clay as above, shale and coal fragments (2 to 6 mm), "red rock" fragments (3 mm), sulfur crystals, very sandy clay lenses, grayish-black (N2).

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A-II, 10

MAXINE ROCK DISPOSAL AREA**Well No. MO-7
(continued)****Drilled:** 7/28/83

Blow Counts	Interval Sampled (feet)	Description
4-3-3	19.5 - 21.0	Refuse material, dark-gray (N3) to medium-dark-gray (N4), sandy clay, fine-grained, coal, shale, and sandstone fragments (3 mm), shale and sandy shale fragments (22 mm), sulfur crystals, clay layers, medium-dark-gray (N4).
3-3-6	21.0 - 22.5	Refuse material, dark-gray (N3), sandy clay, fine-grained, coal and shale fragments, sulfur stains. At 22.3 feet large sandstone fragments (24 to 28 mm), medium-gray (N5), fine- to medium-grained.
10-20-15	22.5 - 24.0	Refuse material as above with large sandstone fragments (24 to 28 mm), medium-gray (N5), fine- to medium-grained.
11-8-7	24.0 - 25.5	Refuse material, medium-dark-gray (N4), sandy clay, very-fine- to fine-grained, coal and shale fragments (2 mm), dark-yellowish-orange (10YR 6/6) to moderate-reddish-brown (10R 4/6) stains.
3-2-4	25.5 - 27.0	Refuse material, medium-dark-gray (N4), sandy clay, very-fine- to fine-grained, shale and coal fragments (2 to 6 mm), shale, sandy shale and sandstone fragments (18 mm), staining as above, slightly moist.
-- 2	27.0 - 28.5	Refuse material as above, no large sandstone fragments, dry.
-15-17	28.5 - 30.0	Refuse material, medium-gray (N5) to light-gray (N7), clay, slightly sandy, shale fragments (18 mm), fossiliferous, sandstone fragments (15 mm), medium-gray (N5), coal fragments (3 mm).

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A-II, 11

MAXINE ROCK DISPOSAL AREA

Well No. MO-7
(continued)

Drilled: 7/28/83

Blow Counts	Interval Sampled (feet)	Description
8-7-10	30.0 - 31.5	Refuse material, dark-gray (N3), clayey sand, coal, shale, and sandstone fragments (1 to 2 mm), sandy shale and sandstone fragments (12 mm).
6-4-5	31.5 - 33.0	Refuse material as above.
1-9-12	33.0 - 34.5	Refuse material, dark-gray (N3), clayey sand, coal, shale, and sandstone fragments (1 to 2 mm), more sandstone fragments (12 mm) than above.
10-11-7	34.5 - 36.0	Refuse material, dark-gray (N3), clayey sand, coal, and shale fragments (1 to 2 mm), large fragments of sandstone (12 mm).
1-6-7	36.0 - 37.5	Refuse material as above.
1-7-12	37.5 - 39.0	Refuse material as above, moderate-yellowish-brown (10YR 5/4) stain, very slightly moist.
6-17-17	39.0 - 40.5	Refuse material, dark-gray (N3), clayey sand, coal, sandstone, and shale fragments (1 to 2 mm), large sandy shale fragments (12 mm), moderate-yellowish-brown (10YR 5/4) stain.
8-7-6	40.5 - 42.0	Refuse material, dark-gray (N3), clayey sand, fine-grained, shale and coal fragments (1 to 2 mm), sandstone fragments (25 mm), medium-light-gray (N6).
4-6-7	42.0 - 43.5	Refuse material as above, pale-brown (5YR 5/2) mottling.
4-18-17	43.5 - 45.0	Refuse material, dark-gray (N3), clayey sand, fine-grained, shale and coal fragments (1 to 2 mm), sandstone fragments (25 mm), medium-light-gray (N6).

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A-II, 12

MAXINE ROCK DISPOSAL AREA

Well No. MO-7
(continued)

Drilled: 7/28/83

Blow Counts	Interval Sampled (feet)	Description
10-6-4	45.0 - 46.5	Refuse material as above, dusky-red (5R 3/4) stain on large sandstone and sandy shale fragments, sulfur crystals.
-6-6	46.5 - 48.0	Refuse material as above, very moist at 47.0 feet.
-5-10	48.0 - 49.5	Refuse material, dark-gray (N3), sandy clay, fine-grained, coal and shale fragments (1 to 2 mm), shaly sandstone fragments (12 mm), dark-yellowish-orange (10YR 6/6) and dark-reddish-brown (10R 3/4) stains.
1-8-7	49.5 - 51.0	Refuse material, as above, layer of "red rock" at 50.0 to 50.2 feet.
8-10-6	51.0 - 52.5	Refuse material, dark-gray (N3), moderate-red (5R 4/6), dark-yellowish-orange (10YR 6/6), mottled, sandy clay, fine-grained, coal and shale fragments (1 to 2 mm).
6-10-11	52.5 - 54.0	Refuse material as above.
- - 18	54.0 - 55.5	Refuse material as above.
8-10-12	55.5 - 57.0	Refuse material, dark-gray (N3), moderate-red (5R 4/6), dark-yellowish-orange (10YR 6/6), mottled, sandy clay, fine-grained, coal and shale fragments (1 to 2 mm), clay lenses, medium-gray (N5), pyrite crystals.
10-17-17	57.0 - 58.5	Refuse material as above.
10-14-15	58.5 - 60.0	Refuse material as above.

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A-II, 13

MAXINE ROCK DISPOSAL AREA

Well No. MO-7
(continued)

Drilled: 7/28/83

Blow Counts	Interval Sampled (feet)	Description
	60.0 - 61.5	Refuse material, dark-gray (N3), moderate-red (5R 4/6), dark-yellowish-orange (10YR 6/6), mottled, sandy clay, fine-grained, coal and shale fragments (1 to 2 mm), clay lenses, medium-gray (N5), pyrite crystals, "red rock" at 61.0 to 61.5 feet.
2-5-2	61.5 - 63.0	Refuse material to 62.5 feet, "red rock". At 62.5 feet clay, very-pale-orange (10YR 8/2), moderate-reddish-brown (10R 4/6), moderate-brown (5YR 3/4), mottled, sandy, coal fragments (2 mm).
	63.0 - 64.5	Clay, moderate-brown (5YR 3/4), silty, stems, leaves.

Drilling completed.

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MAXINE ROCK DISPOSAL AREA

Well No. MO-8

Drilled: 7/28/83

Blow Counts	Interval Sampled (feet)	Description
<u>Augered:</u>	0 - 10.5	0 to 2.0 feet - clay cap, light-brown (5YR 5/6), grayish-brown (5YR 3/2), moderate-reddish-brown (10R 4/6), mottled, sandy, fine-grained, micaceous.
		2.0 to 10.5 feet - refuse material as in MO-7.
<u>Sampled at 10.5 feet.</u>		
19-25-30	10.5 - 12.0	Refuse material, dark-gray (N3), sandy clay, coal and shale fragments (1 to 2 mm), sandstone fragments (24 mm), fine-grained.
7-9-8	12.0 - 13.5	Refuse material, as above, sandstone fragments (18 mm).
3-4-5	13.5 - 15.0	Refuse material, dark-gray (N3), sandy clay, coal and shale fragments (1 to 2 mm), sandstone fragments (24 mm).
2-10-17	15.0 - 16.5	Refuse material, dark-gray (N3), sandy clay, more clay than above, coal and shale fragments (6 mm).

Drilling completed.

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A-II, 15

MAXINE ROCK DISPOSAL AREA

Well No. MO-9

Drilled: 7/29/83

Blow Counts	Interval Sampled (feet)	Description
<u>Augered:</u>	0 - 10.0	0 to 3.5 feet - clay cap, light-brown (5YR 5/6), grayish-brown (5YR 3/2), moderate-reddish-brown (10R 4/6), mottled, sandy, fine-grained, micaceous. 3.5 to 10.0 feet - refuse material, grayish-black (N2), sandy clay, shale, coal and sandstone fragments.
	<u>Samples at 10.0 feet.</u>	
17-23-25	10.0 - 11.5	Refuse material, grayish-black (N2), sandy clay, very-fine-grained, coal and shale fragments (2 mm), sandstone fragments (6 to 12 mm). At 13.0 feet - sandstone fragments up to 50 mm.
6-9-9	20.0 - 21.5	Refuse material as above, slightly more clay. At 24.0 to 25.0 feet - large sandstone fragments (45 mm).
7-11-25	25.0 - 26.5	Refuse material, grayish-black (N2), sandy clay, very-fine-grained, coal and shale fragments (2 mm), sandstone fragments (6 mm).
7-10-21	30.0 - 31.5	Refuse material, grayish-black (N2), sandy to silty clay, very-fine-grained, coal and shale fragments (2 mm), sandstone fragments (6 to 12 mm).
10-14-30	35.0 - 36.5	Refuse material, grayish-black (N2), sandy clay, fine-grained, shale and coal fragments (2 mm), clay layers, grayish-black (N2), moist, medium-light-gray (N6) stain.

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A-II, 16

MAXINE ROCK DISPOSAL AREA

Well No. MO-9
(continued)

Drilled: 7/29/83

Blow Counts	Interval Sampled (feet)	Description
11-19-25	40.0 - 41.5	Refuse material as above to 41 feet, very moist. At 41 feet - refuse material, medium-gray (N5), silty clay, more clay than above, light-gray (N7) stain.
17-18-15	41.5 - 43.0	Refuse material, medium-dark-gray (N4), silty clay, clay lenses "layered" between refuse material, very small fragments (1 mm) of "red rock".
<u>Augered to 45.0 feet. (to allow for cave in)</u>		Refuse material as above.
Drilling completed.		

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